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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/528,713
Filing Date: August 11, 2005
Appellant(s): FOUARGE ET AL.

Tenley R. Krueger
(Registration No. 51,253)
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed February 17, 2009 and November 24, 2008
appealing from the Office action mailed July 24, 2008.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

US 3,595,846	Rouzier	7-1971
US 3,093,482	Weinreich	6-1963

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claim 38 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

In light of MPEP 2173.05(i), any claim containing a negative limitation which does not have basis in the original disclosure should be rejected under 35 U.S.C. 112, first paragraph as failing to comply with the written description requirement. Since appellants' original disclosure does not have any basis for the negative limitation "without the aid of a pump disposed within the bypass line" as claimed in claim 38, the rejection set forth under 35 U.S.C. 112, first paragraph is proper.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

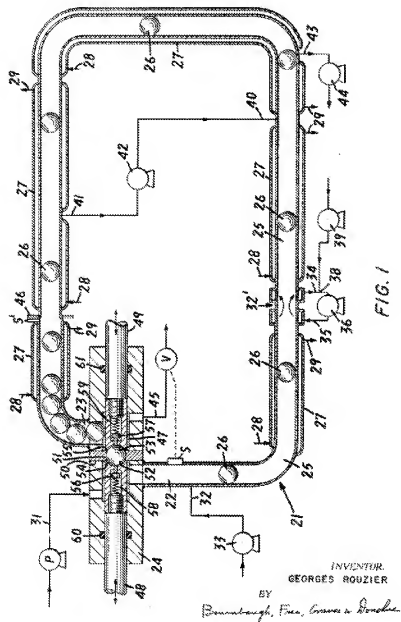
(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
4. Claims 17-30, 34-36, 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rouzier (US 3,595,846).

36. (Currently Amended) A method of forming polyolefins comprising:
supplying ethylene monomer in a carrier liquid to a reactor system comprising at least one loop reactor;
circulating the ethylene through the loop reactor in the presence of a catalyst system to form a slurry of polymer fluff particles in the carrier liquid;
altering the flow of at least a portion of the slurry by at least one of:
flowing a portion of the slurry through a bypass line extending from one location of the loop reactor to another location of the same loop reactor;
operating a circulating pump and circulating the slurry through the loop reactor at an efficiency of from 30-75% of a pump capacity; or
providing a plurality of obstacles in a flow path of the slurry within the loop reactor; and
while continuing the introduction of the carrier liquid and ethylene monomer into the loop reactor, withdrawing a portion of the slurry from the loop reactor as a polymer product.

Rouzier (Figure 1; col. 1, line 23-30) discloses a polymerization process for ethylene (col. 3, line 29) in the presence of heptane and catalyst (col. 6, line 49), where the monomer can be feed through line 31 of the reactor. Rouzier (col. 3, line 51-55; col. 6, line 46-50) clearly discloses a polymerization process involving the circulation of monomers in a slurry of polymer (fluff) partitioned off by movable separators (or the obstacles as claimed). Regarding the claimed "flowing a portion of the slurry through a bypass line extending from one location of the loop reactor to another location of the same loop reactor", Rouzier (Figure 1; col. 6, line 51-55) discloses "flowing a portion of the slurry through a bypass line (item 41) through a pump (item 42) through line (item 40) to another location of the same loop reactor. Regarding the claimed "withdrawing a portion of the slurry from the loop reactor as a polymer product", Rouzier (Figure 1; col. 7, line 6-8) discloses that portion of the slurry can be drawn off by means of a pump through line 43. For circulating the slurry, Figure 1 of Rouzier clearly discloses the use of pumps (item 36, 39, 42).



The difference between the invention of claims 17-30, 34-36, 38 and Rouzier is that Rouzier does not disclose "circulating the slurry through the loop reactor at an efficiency of from 30-75% of a pump capacity".

However, Rouzier in Figure 1 clearly discloses the use of pumps (item 36, 39, 42). Although Rouzier does not disclose "circulating the slurry through the loop reactor at an efficiency of from 30-75% of a pump capacity", it would not be difficult to one of ordinary skill in art to recognize that the pump for circulating the polymer slurry should be run at a safe range or capacity within the capability of a pump to avoid equipment failure. Motivated by the expectation of success of developing a polymerization process for polymerizing ethylene, it would have been obvious to circulate the slurry at an efficiency that is not too low or too high capacity relative to the maximum capacity of a pump to obtain the a range that fully encompasses the 30-75% of a pump capacity feature as claimed.

Regarding the difference between the invention of claims 17-30, 34-36, 38 and Rouzier that Rouzier does not disclose the amount to be bypassed, appellants must recognize that Rouzier in Figure 1 clearly discloses "flowing a portion of the slurry through a bypass line (item 41) through a pump (item 42) through line (item 40) to another location of the same loop reactor". Therefore, generically, the examiner has a reasonable basis to believe that the amount as claimed in claims 18, 19, 26, 27 is included in the amount as taught in Rouzier. Motivated by the expectation of success of developing the process of Rouzier, it would have been obvious to one of ordinary skill in art to apply "routine experimental design" to obtain the amount feature of claims 18, 19, 26, 27. To obtain a valid patent, appellants should submit comparative data to show the criticality of the claimed amount to be bypassed of claims 18, 19, 26, 27.

Regarding the difference between the invention of claims 20-22 and Rouzier that Rouzier does not disclose the angle between the bypass line and the loop reactor, appellants must recognize that Rouzier in Figure 1 clearly discloses "flowing a portion of the slurry through a bypass line (item 41) through a pump (item 42) through line (item 40) to another location of the same loop reactor". Although diagrammatically, the angle is between the bypass line and the loop reactor is at 90 degree. However, the examiner believes that the said angle should not be restricted by Figure 1 because it is merely a technically drawing describing a concept. However, the examiner has a reasonable basis to believe that the angle as claimed in claims 20-22 is generically taught in Figure 1 Rouzier. Motivated by the expectation of success of developing the process of Rouzier, it would have been obvious to one of ordinary skill in art to apply "routine experimental design" to obtain the angle feature of claims 20-22. To obtain a valid patent, appellants should submit comparative data to show the criticality of the claimed angles of claims 20-22.

Regarding the difference between the invention of claims 23, 24 and Rouzier that Rouzier does not disclose ratio DB/DL range as claimed, appellants must recognize that Rouzier in Figure 1 clearly discloses "flowing a portion of the slurry through a bypass line (item 41) through a pump (item 42) through line (item 40) to another location of the same loop reactor". Since the bypass line is for pumping a portion of the slurry to be recirculated, it would not be difficult for one of ordinary skill in art to recognize that the bypass line is not required to be same diameter of the loop reactor or to have the same capacity of the loop reactor. Therefore, motivated by the expectation of success of

developing the process of Rouzier, it would have been obvious to one of ordinary skill to employ a DB/DL ratio of less than 1 to obtain the invention of claims 23, 24. To obtain a valid patent, appellants should submit comparative data to show the criticality of the claimed range of DB/DL ratio of claims 23, 24.

Regarding the difference between the invention of claims 25-28 and Rouzier that Rouzier does not disclose that the recirculation of the slurry from the pressure side of the impeller blades of said pump to the suction side of the impeller blades of said pump, appellants must first recognize that Rouzier in Figure 1 clearly discloses "flowing a portion of the slurry through a bypass line (item 41) through a pump (item 42) through line (item 40) to another location of the same loop reactor". Further, appellants must recognize that it is well known in the art that the pumps for this particular application are typically performed with pumps having impeller blades. While the impellers are in action for recirculating the said slurry, the action creates a suction side and pressure side. Further, on the pressure side, the slurry is being pumped to the other side of the loop reactor to be recirculated. Portion of the recirculated slurry will be drawn to the suction side of the loop reactor.

Regarding the difference between the invention of claims 26, 27, and Rouzier that Rouzier does not disclose the percent of the portion of the slurry to be recirculated, appellants must recognize that Rouzier in Figure 1 clearly discloses "flowing a portion of the slurry through a bypass line (item 41) through a pump (item 42) through line (item 40) to another location of the same loop reactor". Therefore, generically, the examiner has a reasonable basis to believe that the percent of the portion of the slurry to be

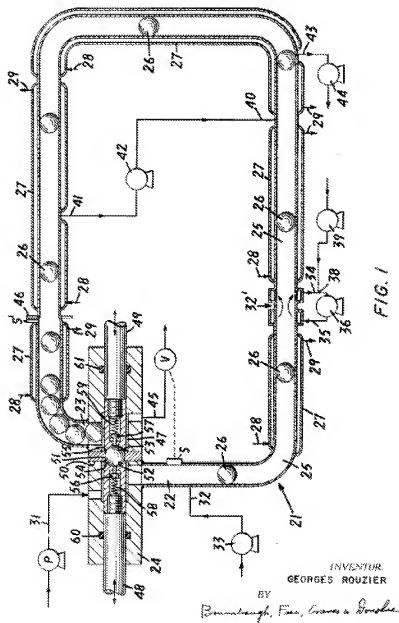
recirculated as claimed in claims 26, 27 is included in the percent as taught in Rouzier. Motivated by the expectation of success of developing the process of Rouzier, it would have been obvious to one of ordinary skill in art to apply "routine experimental design" to obtain the percent feature of claims 26, 27. To obtain a valid patent, appellants should submit comparative data to show the criticality of the claimed percent to be bypassed of claims 26, 27.

5. Claims 29-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rouzier (US 3,595,846), in view of Weinreich (US 3,093,482).

Rouzier (Figure 1; col. 1, line 23-30) discloses a polymerization process for ethylene (col. 3, line 29) in the presence of heptane and catalyst (col. 6, line 49), where the monomer can be feed through line 31 of the reactor. Rouzier (col. 3, line 51-55; col. 6, line 46-50) clearly discloses a polymerization process involving the circulation of monomers in a slurry of polymer (fluff) partitioned off by movable separators (or the obstacles as claimed). Regarding the claimed "flowing a portion of the slurry through a bypass line extending from one location of the loop reactor to another location of the same loop reactor", Rouzier (Figure 1; col. 6, line 51-55) discloses "flowing a portion of the slurry through a bypass line (item 41) through a pump (item 42) through line (item 40) to another location of the same loop reactor. Regarding the claimed "withdrawing a portion of the slurry from the loop reactor as a polymer product", Rouzier (Figure 1; col. 7, line 6-8) discloses that portion of the slurry can be drawn off by means of a pump

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through line 43. For circulating the slurry, Figure 1 of Rouzier clearly discloses the use of pumps (item 36, 39, 42).



The difference between the invention of claims 29-30 and Rouzier is that Rouzier does not disclose "circulating the slurry through the loop reactor at an efficiency of from 30-75% of a pump capacity".

However, Rouzier in Figure 1 clearly discloses the use of pumps (item 36, 39, 42). Although Rouzier does not disclose "circulating the slurry through the loop reactor at an efficiency of from 30-75% of a pump capacity", it would not be difficult to one of ordinary skill in art to recognize that the pump for circulating the polymer slurry should be run at a safe range or capacity within the capability of a pump to avoid equipment failure. Motivated by the expectation of success of developing a polymerization process for polymerizing ethylene, it would have been obvious to circulate the slurry at an efficiency that is not too low or too high capacity relative to the maximum capacity of a pump to obtain the a range that fully encompasses the 30-75% of a pump capacity feature as claimed.

Regarding the difference between the invention of claims 29-30 and Rouzier that Rouzier does not disclose that the recirculation of the slurry from the pressure side of the impeller blades of said pump to the suction side of the impeller blades of said pump, appellants must first recognize that Rouzier in Figure 1 clearly discloses "flowing a portion of the slurry through a bypass line (item 41) through a pump (item 42) through line (item 40) to another location of the same loop reactor". Further, appellants must recognize that it is well know in the art that the pumps for this particular application are typical performed with pumps having impeller blades. While the impellers are in action for recirculating the said slurry, the action creates a suction side and pressure side.

Further, on the pressure side, the slurry is being pumped to the other side of the loop reactor to be recirculated. Portion of the recirculated slurry will be drawn to the suction side of the loop reactor.

Further, the difference between the invention of claims 29-30 and Rouzier is that Rouzier does not disclose perforated impeller blade.

Weinreich (Figures 1-4; col. 3, line 1-10, line 26-34) disclose the use of perforated impeller blades to achieve violently agitation for mixing the contents that are being impelled. Motivated by the expectation of success of achieving better mixing, it would have been obvious to one of ordinary skill in art to incorporate perforated impeller blades, or impeller blades possessing holes within the blades, to obtain the invention of claims 29-30.

Regarding the claimed "total surface of the area of the holes in said impeller blades within a range of the total surface area of said blades", appellants must first recognize that Weinreich (Figures 1-4; col. 3, line 1-10, line 26-34) clearly discloses perforated impeller blades for achieving violently agitation. Motivated by the expectation of achieving different level of violet mixing, it would have been obvious to one of ordinary skill in art to use "routine process optimization method" to vary the amount or the size of the holes in the perforated impeller blades to achieve different level of violet agitation to obtain the invention of claims 29-30. In view of the 112 rejection set forth for the recited "empty space", the examiner has a reasonable basis that the rationale set forth for the rejection of claims 29-30 is adequate. Anyway, in view of the substantially identical type of perforated impeller blade for impelling a slurry comprising a polymer,

the examiner also has a reasonable basis to believe that the claimed "empty space" is also inherently possessed by the working mechanism of the perforated impeller blades of Weinreich

Regarding claim 38 which recites "without the aid of a pump disposed within the bypass line", in view of MPEP 2144.04, if the mixing function is longer needed in a process taught, it would have been obvious to one of ordinary skill in art to remove the pump as taught in Rouzier to obtain the invention of claim 38. In view of the 112 rejection set forth, the rationale for the instant rejection is adequate.

MPEP 2144.04: Omission of an Element and Its Function Is Obvious if the Function of the Element Is Not Desired

Ex parte Wu , 10 USPQ 2031 (Bd. Pat. App. & Inter. 1989) (Claims at issue were directed to a method for inhibiting corrosion on metal surfaces using a composition consisting of epoxy resin, petroleum sulfonate, and hydrocarbon diluent. The claims were rejected over a primary reference which disclosed an anticorrosion composition of epoxy resin, hydrocarbon diluent, and polybasic acid salts wherein said salts were taught to be beneficial when employed in a freshwater environment, in view of secondary references which clearly suggested the addition of petroleum sulfonate to corrosion inhibiting compositions. The Board affirmed the rejection, holding that it would have been obvious to omit the polybasic acid salts of the primary reference where the function attributed to such salt is not desired or required, such as in compositions for providing corrosion resistance in environments which do not encounter fresh water.). See also In re Larson, 340 F.2d 965, 144 USPQ 347 (CCPA 1965) (Omission of additional framework and axle which served to increase the cargo carrying capacity of prior art mobile fluid carrying unit would have been obvious if this feature was not desired.); and In re Kuhle, 526 F.2d 553, 188 USPQ 7 (CCPA 1975) (deleting a prior art switch member and thereby eliminating its function

was an obvious expedient).

(10) Response to Argument

Appellant's arguments filed February 17, 2009 and November 24, 2008 have been fully considered but they are not persuasive.

Regarding the 112, first paragraph, rejection, appellants argue that "the flow circulates through the bypass line without the aid of a pump disposed within the bypass line is clearly supported by the specification", appellants fail to recognize that the claimed negative limitation "without the aid of a pump" is still not supported by the original specification filed.

Appellants argue that Rouzier does not teach the loop reactor as required by the pending claims because Rouzier teaches a liquid stage tubular reactor having a discrete point of origin and terminal point, wherein the reaction medium passes through the tubular reactor a single time before withdrawal. Then appellants argue that one of ordinary skill in art would aware that loop reactors include continuously circulating polymer slurry through the reactor. However, the examiner disagrees because the claims as written do not support the argument that involves continuously circulating.

While appellants point out that Rouzier broadly teaches a polymerization process and apparatus that is suitable for bulk, solution, suspension, and emulsion polymerization, appellants believe that Rouzier does not teach a process involving a slurry of polymer fluff particles in the carrier liquid. However, the examiner disagrees. First, appellants must recognize that "polymer fluff particles" are typically the term

describing the polymer isolated from the slurry process before the pelletization in an extruder. Therefore, "a slurry of polymer fluff particles" and "a slurry of polymer particles" functionally mean the same thing, "a slurry of polymer". In view of substantially identical solvent carrier and polymers involved in Rouzier and as claimed, there is not a basis for the examiner to believe that the solution, suspension, and emulsion process as taught in Rouzier does not involve a slurry of polymer fluff particles.

Regarding appellants' argument that the process as taught in Rouzier does not relate to a slurry process because the working examples disclosed in Rouzier only relates to process comprising a solvent, appellants fail to recognize that the teachings of Rouzier are not limited to its preferable embodiment. Appellants must recognize that Rouzier (col. 2, line 23-30) clearly discloses polymerization and copolymerization of olefins and diolefins that are typically polymerized in the presence of a solvent to form slurry of polymers. Further, Rouzier (col. 3, line 26-36) clearly indicates that the disclosed polymerization processes include polymerized products in the form of suspension and emulsion (a different form of slurry). Therefore, after reading the polymerization process teachings of Rouzier, it would not be difficult to one of ordinary skill in art to recognize and appreciate a polymerization process involving a slurry such as a suspension or an emulsion.

Regarding appellants' argument that the bypass line as claimed does not require a pump, appellants fail to recognize that the claims other than claim 38, do not exclude a bypass line comprising a pump. Therefore, appellants' argument is not supported by

Regarding appellants' argument that the teachings of Weinreich are no more pertinent to appellants' disclosure than the primary references cited, appellants must recognize that Weinreich (Figures 1-4; col. 3, line 1-10, line 26-34) clearly disclose perforated impeller blades which are very similar to the perforated impeller blades as claimed for achieving violently agitation. Motivated by the expectation of achieving different level of violet mixing, it would have been obvious to one of ordinary skill in art to use "routine process optimization method" to vary the amount or the size of the holes in the perforated impeller blades to achieve different level of violet agitation to obtain the invention of claims 29-30.

Appellants must first recognize that Rouzier in Figure 1 clearly discloses "flowing a portion of the slurry through a bypass line (item 41) through a pump (item 42) through line (item 40) to another location of the same loop reactor". Further, appellants must recognize that it is well know in the art that the pumps for this particular application are typical performed with pumps having impeller blades. Therefore, both Rouzier and Weinreich relate substantially identical endeavors of using a pump and its impeller blades for achieving better mixing. In view of the reasons set forth above, the combined teachings of Rouzier and Weinreich are proper for the instant 103 rejection.

In view of the reasons set forth above, the rejections set forth are proper.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/William K Cheung/
Primary Examiner, Art Unit 1796

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